

Transforming the construction industry towards the next normal.

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Transforming the Construction Industry towards the Next Normal

The conjecture of the “*next normal in construction industry*” was catalysed by the impact and gaps created by the COVID-19 pandemic on the construction industry in the year 2020. More significantly, principles underpinning the drive to ‘Construction Industry 4.0’ became more pronounced in terms of their application during the COVID-19 pandemic with increased application of digitalisation through virtual environments for enhanced construction collaborations, sustainability, and productivity. Consequently, this Special Issue (SI) proposed a nexus between the construction industry trends within the niches of the circular economy; building information modelling; cost reduction and maintenance; construction digitalisation; designing for sustainability; low-zero carbon technology; and transitioning construction stakeholders, projects and organisations towards the next normal.

The SI was able to elicit twelve (12) papers from researchers who provided insight into multidimensional themes probing into literature reviews, case studies, bibliometric analysis, and quantitative analysis within the abovementioned themes. The first three (3) papers delved into emerging technologies, labour productivity and remote working in the construction industry for the new normal. Then, a paper on the linkage between income levels and building prices provided a dynamic context for assessing the affordability of housing prices, considering the requirement of remote working. The next category of papers comprising three (3) papers probed the execution of sustainability within the construction industry for the next normal. Circular economy and offsite construction practices in the construction industry were thereafter reviewed and investigated within two (2) papers as part of mechanisms for transforming the construction sector towards the next normal. The next two (2) papers focussed on the transitioning and procurement initiatives for renewable energy. Finally, the limitations of transforming the construction sector towards the next normal were studied in the last paper.

The first set of papers on emerging technologies, labour productivity and remote working in the construction industry for the new normal featured a paper by Moktar et al. (2022). The authors applied a case study approach to study the interest in remote working in the construction profession in the largest construction companies in the UK. Moktar et al. (2022) asserted the value of a hybrid working approach whereby on-site and off-site work arrangements ensured affordability and productivity for the employer and employees of the construction companies. Rankohi et al. (2022) applied a case study and focus group research technique to stimulate the addressing of knowledge gaps in integrated project delivery (IPD) for the new normal in the Canadian construction industry. Rankohi et al. (2022) asserted that since the COVID-19 pandemic commenced in 2020, technological, organisational, geographical and cognitive barriers limit the IPD in the project life cycle. The authors further discussed the application of IPD in handling construction challenges in the new normal. Labour productivity has been a challenge for the construction industry before the 2020 pandemic and more so in the new normal. Thus, construction labour performance and grading evaluations for enhanced productivity were studied by Manoharan et al. (2022) in Sri Lanka. The authors

applied a mixed-method approach and presented a framework for assessing labour training, competencies for labour performance and grading. The findings of Moktar et al. (2022), Rankohi et al. (2022), and Manoharan et al. (2022) produced clarity on the working milieus of skilled and unskilled professionals in the construction industry within the undercurrents of changes in procurement practices for the new normal.

The second category of papers in this SI publication focused on how remote working influenced the affordability of housing prices, as presented by Gyadu-Asiedu et al. (2022). The authors extracted primary and secondary data from Ghana. The data were analysed to create interconnections between residential housing prices and the annual average income of public sector employees. Gyadu-Asiedu et al. (2022) explicitly emphasised the disparity between employees' income and residential housing prices in Ghana. COVID-19, the economic downturn in Ghana, the Russian-Ukraine war and the infrastructure deficit in Ghana cultivated the disparity. The abovementioned socio-economic disproportions potentially despaired remote working in Ghana and other countries exhibiting similar negativities in the new normal.

The realisation of sustainable construction in the next normal is hinged on government policies, existing infrastructure and practices. Ogunnusi et al. (2022) applied the multi-criteria decision-making technique for order preference by similarity to an ideal solution (TOPSIS) to select the best approach to making abandoned public buildings in Nigeria more sustainable. The analysis stressed the importance of refurbishing abandoned public buildings using a framework designed for this purpose. Pim-Wusu et al. (2022) applied the structural equation modelling (SEM) analysis to develop a framework for the implementation of sustainable construction in small and medium enterprises (SMEs) in Ghana. The authors' propositioned education, training, government support and centralised information hubs for SMEs in Ghana as the drivers for sustainable construction for the next normal. Ewuga et al. (2022) agreed that sustainable construction had been introduced in the supply chain network of Ireland by Construction-contracting firms, thereby, providing an enabling platform to facilitate sustainable construction in Ireland for industry transformations.

Sustainable construction is critical for transforming the construction industry towards the next normal. The studies conducted by Ogunnusi et al. (2022); Pim-Wusu et al. (2022); and Ewuga et al. (2022) across three countries (Ghana, Nigeria and Ireland) and two continents (Africa and Europe), all point to the direction of looking into the past for future improvements of infrastructure, procurement practices and organisations. Reportedly, the implementation of sustainable construction in Ireland has been feasible by building a long-term relationship, trust, knowledge of the construction process, commitment, a common goal, and mutual support. Ewuga et al. (2022) subsequently studied how this was achieved by applying a mixed-method approach involving the relative importance index (RII) and resource-based view (RBV) theory.

The tenets of circular economy (CE) in construction and offsite construction (OSC) can be associated with sustainable construction. Hence, in transforming the construction industry towards the next normal, previous studies on circular economy and offsite construction may spur the furtherance of waste reduction philosophies in the construction sector, as studied by

Obi et al. (2022). The authors presented a comprehensive bibliometric review of peer-reviewed publications on circular economy and offsite construction between the years 2000 and 2021 with the agenda of combining the attributes of both concepts for construction industry transformation. The reinforcements for the convergence of CE and OSC are entrenched in sustainable construction, waste mitigation in construction, life cycle assessment, building information modelling (BIM), circular business models, deconstruction and supply chain management. Additionally, Amudjie et al. (2022)'s investigation into built environment professionals' awareness of CE in Ghana explicated the need for further studies into the application of CE in the construction sector. Amudjie et al. (2022) applied descriptive and inferential analysis to reveal a moderate awareness level of repair and reuse CE principles amongst built environment professionals in Ghana. The CE and OSC studies investigated by Obi et al. (2022) and Amudjie et al. (2022) affirmed the drive for further research into the concepts mentioned above for a successful construction industry transformation globally. Construction organisations in developed and developing economies are still oblivious of CE and OSC. The dearth of technical skills to explore the benefits of CE and OSC in construction organisations has been a recurring barrier.

Transitioning to renewable energy and procurement initiatives aligns with sustainable development goals (SDGs) for the year 2030. SDGs targets and the new normal in the construction sector require a changing pattern of energy generation and investments for climate change mitigation. Thus, Unuigbe et al. (2022) investigated how commercial buildings in Nigeria can switch to solar photovoltaic (PV) panels (a form of renewable energy) from fossil fuel generator sets through a grounded theory approach. The authors exposed congruent limitations and new negative narratives. The limitations are Nigeria's financial and commercial institutionalisation of fossil fuel use. The negative narratives of sustainability in this regard, renewal energy, from the perspectives of construction professionals, necessitates enhancements in terms of incentivisation from the government and cultural and psychological dynamism for a successful transition. Ahmed et al. (2022) produced a study highlighting public-private partnership (PPP) investment in energy and country governance from Sub-Saharan Africa. The study adopted the Kiviet-bias fixed-effect model to deduce corruption implications that deters low PPP engagements for renewable energy investment in Sub-Saharan Africa. Unuigbe et al. (2022) and Ahmed et al. (2022) agreed that the attainment of renewable energy towards the new normal in Sub-Saharan Africa is minimal, and government intervention through construction policies and incentives is essential.

The final paper on transforming the construction industry by Watts et al. (2022) reviewed limitations under the broad themes of the circular supply chain, digital twins, modern methods of construction and zero carbon. Watts et al. (2022) interviewed fifteen (15) participants spread across eight (8) UK construction organisations. Watts et al. (2022) intention of this study was to expose the knowledge and practical gaps in transforming construction strategy perceptions of UK construction professions. Construction professionals in this study recognised themselves as bystanders and not active participants in the UK construction transformation initiatives. This underscored a new challenge for the government's direct involvement of construction professionals not only through professional bodies such as the Royal Institute of Chartered

Surveyors (RICS) and Chartered Institute of Building (CIOB) but through the construction industry forums.

The articles published in this SI widened contextual viewpoints from remote working, construction labour performance measurement, digitalisation, rising prices of residential housing as a result of remote working, sustainable construction, which can be tied to circular economy, offsite construction, renewable energy, and government strategies for transforming the construction industry. The transformation of the construction sector towards the new normal is a global phenomenon. Consequently, the articles published in this SI presents global contexts from Sub-Saharan Africa (Ghana, Nigeria and South Africa), North America (Canada), Europe (the United Kingdom and Ireland), and Asia (Sri Lanka). The authors in this SI produced multiple transdisciplinary perspectives between engineering, business management, energy, construction and project management to surrogate contributions to knowledge and furtherance of implications for future studies. The value of the papers published in this SI will benefit the targeted audience: academics, researchers, policymakers, research students and industry practitioners.

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